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ABSTRACT

To assess a child's communicative ability, it is important to develop not only measures of his understanding of vocabulary, but of his understanding of the syntax of language: patterns of words, regularities, and relationships of words in a sentence. Controlled test situations should be established in which the child receives minimal cues from the situation itself. Children should clearly understand the meanings of the words used, and test items should be constructed so correct answers cannot be given unless the child comprehends the syntax being tested. The child is verbally instructed on what to do with toy test materials such as boy and girl dolls, blocks, toy animals, marbles, sticks, and clay. Problems are set up in terms of levels of difficulty. First level items include testing children's understanding of active sentences singular/plural nouns, and possessive noun inflection. Second level items include negative/affirmative statements, and questions, singular/plural with noun and verb inflections, and adjectival modification. Third level problems test for understanding of negative affix, reflexivization, comparatives, passives, and self-embedded sentences. Although the tests of comprehension of syntactic construction have not all been tried or standardized, they are based on linguistic theory, psycholinguistic research, and developmental studies of children's speech. (NH)

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Some Language Comprehension Tests

Ursula Bellugi-Klima

Ability to use language adequately is considered to be essential to school success. If English sentences addressed to him do not convey the right meaning to the child, or if he cannot communicate his ideas plainly to others, the child is likely to have learning difficulties. To find out how the child is doing and to assess whether he is improving in his ability to communicate, teachers use a variety of measures. Some use standardized tests like the Peabody which is a measure of vocabulary. However, how the child puts words together to form sentences is even more important to know what children understand of the syntax of language: that is, not the meanings of individual words, but the particular patterns of words, regularities, and relationships of words in a sentence.

All adults know a great deal about the syntax of lnaguage as speakers of a language. We can demonstrate this by examining a sentence of Lewis Carroll's "Jabberwocky." Look at:

"The slithy tove did gyre and gimble in the wabe."

The main words in this sentence are all non-English words, combinations we've never heard before: "slithy," "tove," "gyre," "gimble," "wabe." The words we recognize are the small unstressed words of English which are not nouns or verbs - "the," "did," "in," "and." A string of words like "slithy," "tove," "gyre," "gimble," and "wabe" conveys nothing in the way of grammatical information. And yet, as we read the sentence, it seems to us that we can at least partially understand it. Let's examine what this "partial understanding" means and what source of it is in the sentence.

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Look first at "the slithy tove" and "the wabe." "Tove" and "wabe" seem to us to be nouns, because they follow the definite article "the." "Slithy tove" seems to be a nounphrase like "dirty room," because the word in between the article and the presumed noun ends in "-y" which suggests an adjective. The "slith tove" would still seem to us a nounphrase, but perhaps more like peanut butter. The "slithy tove" would seem like a nounphrase, but like "the sailing ship." so we sense that "tove" is the head noun of a nounphrase and that "slithy" is an adjective modifying "tove." Now look at "did gyre and gimble." These words follow the nounphrase, and seem to us to be the verbphrase of the sentence. We guess this because they follow the auxiliary ver "did" as in "he did do it." "Gyre" and "gimble" are connected by "and" which suggests that these are coordinate main verbs as in "run and play." Since they are not followed immediately by a nounphrase, but instead by "in" plus a nounphrase ("the wabe"), we sense that they are intransitive verbs with a prepositional phrase following (as in "jump in the hay" and not like the verb in "I want some cookies" which requires an object). We notice that all this information is given to us by the relational words, the order of the words, their relationship to one another, and not by the words alone. If we rearrange the words in the same grammatical pattern:

"The gimbly wabe did slithe and gyre in the tove,"

we notice that our sense of what is the subject, verb, adjective, etc. immediately changes.

We want to investigate, then, what children understand of the syntax of English. The common observation that children understand much more than they produce is made almost invariably without examining the limits of this understanding closely. In order to determine comprehension of syntax reliably, we nned to set up carefully controlled situations in which the child gets minimal cues from the situation itself. We must make sure that the words are a part of the child's vocabulary, either by teaching him,

or by using words known to most children of a certain age. We must construct test items so that the only way the child can give the correct answer is by comprehension of the particular construction we are interested in.

Take as an example the passive construction. To test, we must a) Eliminate situational cues. Take the sentence: "The apple was eaten by the doll." It is a well-formed passive sentence. We could ask the child to act it out for us, and provide him with an apple and a doll. But even if he did perform correctly, it would not be conclusive evidence that he understood the passive construction. He might do exactly the same thing if we gave him the apple and the doll and said, "Do something with these." In his world, children are likely to eat apples, and not sit on them, put them on their heads, smash them, or be acted upon in any way by apples. This, then, is not a good test as it stands. b) Make sure the child knows vocabulary, so we are really testing understanding of syntactic constructions. Suppose we asked the child to act out "The construction was demolished by the superintendent." If he failed to perform correctly we would not know whether he failed to understand the words or the passive construction. In each case we must be sure that the objects are known to the child so we are testing understanding of syntax only. c) Ensure that understanding of syntax is requisite for the correct answer. One way of solving this problem is to set up pairs of sentences which differ minimally with respect to the syntactic problem we want to study, and demand that correct responses require differentiating the two. With passive sentences, we might use sentences in which either the first or the second noun could be the subject or object of the verb. The verb "push" can take an animate subject and an animate object: a boy can push a girl and vice versa. This gives us the basis for a minimally contrasting pair of sentences, where the only difference between the two sentences is in word order, that is, in subject-object relations. "The boy is pushed by the girl," and "The girl is pushed

by the boy." This seems a valid test for understanding of the passive construction in English.

A number of significant syntactic constructions can be tested for in this way. It seems a good method for examining comprehension since it requires the children to process the sentence in language-like situations, and to act out their understanding of the relationship of parts of a sentence.

Comprehension Tests

Some comprehension tests for syntactic constructions will be suggested. In each case, these few examples can be extended to include other constructions, depending on what materials are available. Some basic materials for these tests include male and female dolls (with flexible limbs); a wash cloth; doll's fork or spoon; blocks of assorted shapes and sizes; toy cat and dog or other animals; supply of marbles; clay; sticks of assorted colors, lengths, widths; balls; some dolls' clothing; a bottle and cork; etc. Other materials which are ordinarily available in nursery school situations can be substituted if necessary, providing the problem still meets the demands set up in the previous section.

The objects for each problem should be set up on the table in such a way that they do not give cues to the solution of the problem (in terms of ordering or other cues) and in a way that the child has to make some change or movement to demonstrate comprehension of the problem. If the problem has more than one part, it need not necessarily be given in any fixed order (mixing up orders of presentation would minimize the effects of "set"). The objects should be replaced in their original indeterminate position before asking another part of the problem.

The examiner should make sure at the onset of the problem that the child understands the words and actions involved. For example, for the problem "The boy is washed by the girl," the examiner would identify the boy doll and the girl doll, and demonstrate how one washes the other,

being careful not to give any cues to the problem. He might say for example, "This is how we wash." You then check the child's understanding of "boy," "girl," and "wash" before beginning. In the process it might be wise to change the order of presentation of boy and girl, so that no cues to ordering are given. Then the objects are set up in a standard way and the problem can be given.

The problems are set up in terms of levels of difficulty. This is based on order of appearance of constructs in children's speech in current developmental studies (Brown et al.), on results of other comprehension tests (Fraser, Bellugi, and Brown), and on proposed psycholinguistic research (Olds, Sinclair personal communication). Not all of these tests have been tried or standardized. They should be considered as proposals based on linguistic theory, psycholinguistic research, and developmental studies of children's speech.

First Level Items

Active Sentences

In the normal or most common English sentences, the first occurring noun is the subject or actor, and the noun which follows the verb is usually the object of the verb, or the recipient of the action of the verb. Thus, "John hits Mary" does not mean the same thing as "Mary hits John." A basic question, then, is does the child understand this subject--ver--object relationship? Given a verb, does he know that the noun which precedes the verb is generally the actor or subject, and that the noun which follows the verb is the acted upon or object. We can test this by asking him to act out the following pairs of sentences: (NB, They need not be presented consecutively.)

The boy washes the girl.

The girl washes the boy.

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The cat chases the dog.

The dog chases the cat.

The boy feeds the girl.

The girl feeds the boy.

In each of the cases the objects are placed on the table in front of the child and are each correctly identified, and the action is demonstrated, so that word meanings, referents, and conventions of demonstration are all known by the child, and we are really testing for subject/object relationships.

Singular/Plural Noun

One of the early inflections to appear in children's speech is the inflection on the plural noun. However it is a period of several months before these appear with any regularity where the situation and the context require them. In many sentences the plural inflection on the noun is redundant; that is, it may be signalled by some other means in the sentence. Notice the following examples: "There are two books." "These are spiders." "We have some plates." There are other cues to plurality in these sentences: the plural form of the copula "are," the plural of the demonstrative "these," and the form "some" with a count noun.

We want to test for comprehension of plural in the unusual case in which no other cues in the sentence indicate plurality. One method is as follows:

A small collection of objects (balls, marbles, clips, etc., as the problem requires) is placed on the table in front of the child. After they are identified, the instructions are given:

Give me the marble.

Give me the marbles.

Give me the ball.

Give me the balls.

Give me the clips.

Give me the clip.

Possessive

A somewhat later inflection to appear in children's speech is the possessive inflection on nouns. Noun plus noun constructions appear earlier but without the inflection, as in "Mommy dress," "baby ball," etc. Here we want to examine the child's understanding of the possessive construction. In this case, there are two nouns occurring and the first is a modification of the second. It is the second noun which is the head noun of the nounphrase: one could paraphrase "Mommy's shoe," as the shoe which belongs to Mommy, or the shoe which Mommy has. To test the child's comprehension of the possessive, we can set up some minimal pairs:

A small boy doll and a larger man doll. Identify one as the son and the other as the father.

Show me the boy's daddy.

Show me the daddy's boy.

A toy truck with a separate figure of a man driving the truck in the driver's seat.

Show me the truck's driver.

Show me the driver's truck.

A toy boat with the figure of a man on board who can be identified as the captain.

Show me the captain's ship.

Show me the ship's captain.

Second Level Items

Negative/Affirmative Statements

At a rather early stage, it is not clear that children process the negative aspect of a sentence when it is presented embedded in a sentence attached to the auxiliary verb. It is, in fact, often contracted with the auxiliary verb, generally unstressed, and not very salient. In some dialects, the difference between "I can do it" and "I can't do it" is only a minimal vowel sound change. We want to examine, then, if children process the negative (when attached to an auziliary verb), and further, if they understand this as negating the sentence. This is not easy to demonstrate but we might try the following pairs. (Note that each one uses a different negative and auxiliary combination.)

Two dolls - one has movable arms; the other has arms that can't move. Demonstrate this without using the negative in sentences.

Show me: The doll can't put his arms down.

Show me: The doll can put his arms down.

Two dolls with flexible legs and a small chair or ledge. Show process of "sitting."

Show me: The doll is sitting.

Show me: The doll is not sitting.

Two dolls and a hat which can fit on the head of either.

Show me: The doll doesn't have a hat.

Show me: The doll has a hat.

Negative/Affirmative Questions

The problem is similar to the one above but involves "wh" questions rather than statements.

About six objects on the table, some of which are edible and some inedible. For example, a rubber ball, an apple, a cookie, a pencil,

a flower, an orange. Examiner hold out hand.

What can't you eat?

What can you eat?

A girl doll and some objects of clothing plus other objects. For example, a blouse, some shoes, a piece of chalk, a candle, a coat, a fork. Examiner hold out hand.

What does she wear?

What doesn't she wear?

Singular/Plural with Noun and Verb Inflections

We have mentioned that the noun ending for plurality is one of the early inflections to appear. Considerably later the verb ending for third person singular appears (present indicative tense). Notice the ending on the verb in the following contexts: "I go," "you go," "we go," "they go," but "he goes." For singular and plural sentences in the third person (or with other than pronominal subjects), we find that the inflection occurs on the verb for singular and on the noun subject for plural. Notice the following pair: "The bird sings," "The birds sing." At a period of overregularization, we sometimes hear children give the following singular plural forms: "The dog dig," "the dogs digs." We can test for understanding of singular/plural with noun and verb inflections as follows:

Two girl dolls lying down. Demonstrate "walking" for child. Replace items after each part of problem.

Show me: The girl walks.

Show me: The girls walk.

Two boy dolls lying down. Demonstrate "jumping."

Show me: The boys jump.

Show me: The boy jumps.

Two girl dolls and two washcloths (or brooms). Demonstrate "washing: (or "sweeping").

Show me: The girls wash.

Show me: The girl washes.

Modification (Adjectival)

As part of a nounphrase an adjective modifies or affects the meaning of the head noun of its nounphrase. Thus, we would guess that "slithy" modifies or affects the meaning of "tove" in the jabberwock sentence we considered. This applies only to the head noun of the nounphrase in which the adjective occurs. Thus, "big" in "The big boy ate an apple" applies only to the description of "boy" and is irrelevant to our understanding of "apple." We can test children's comprehension of adjectival modification by the following types of examples:

On the table are placed a large and small boy and a large and small ball. Identify only boys and balls for the child.

Show me: The little boy has a big ball.

Show me: The big boy has a little ball.

A round button, a square button, a round block, and a square block, are on the table.

Put the round button on the square block.

Put the square button on the round block.

A white dress with large black buttons. A black dress with large buttons (not black).

Show me the dress with black buttons.

Show me the black dress with buttons.

Third Level Problems

Negative Affix

Until now the negatives with which we are dealing have been sentence negations. There is another type of negation which has as its scope the word

to which it is attached, and not the sentence. We want to know if the child understands the effect of the prefix "-un" before a word. Affixal negation is a late-appearing aspect of grammar in the children's speech.

To test for understanding, we need to invent uncommon combinations of "un" and words. We want to guard against the possibility that children have learned both forms as separate vocabulary items as could be the case, for example, with "tied" and "untied."

In addition, we can test the effect of multiple negations with the negative affix. "John is happy" is clearly affirmative in meaning. "John is unhappy" has as one semantic interpretation, "It is not the case that John is happy." "John is not unhappy" does not have the same interpretation as "John is happy," but the two negatives do in a sense cancel one another out, and on a happiness continuum this sentence would certainly be more in the direction of "John is happy" than the previous one. We can easily add this dimension to our comprehension problems, then, in the following manner:

An array of blocks on the table. Some are flat on the table; some are piled on top of one another. As usual, replace in original position before asking another problem.

Show me: The blocks are piled.

Show me: The blocks are unpiled.

Show me: The blocks are not unpiled.

Two jars or bottles with corks which fit in easily. One is corked and one uncorked. Let child try the process first.

Show me: The bottles are corked.

Show me: The bottles are not corked.

Show me: The bottles are not uncorked.

A piece of cloth or dress with large snaps which are easily managed by children. Demonstrate and let children try snapping and unsnapping without using the words.

Show me: The dress is not unsnapped.

Show me: The dress is snapped.

Show me: The dress is unsnapped.

Reflexivization

Reflexives, like "John looked at himself in the mirror," also appear rather late in children's speech. Earlier forms might be the objective case pronoun instead of the reflexive pronoun ("I saw me"). We want to investigate the child's understanding that the self form of the pronoun after certain verbs refers back to the subject of the verb. We can test by the following means:

Two boy dolls on the table and a washcloth between them. Show action of washing. Introduce dolls by name, for example, "This is John and this is Bill."

Show me: John washed him.

Show me: John washed himself.

Two girl dolls with flexible arms. Show action of hitting but do not use reflexive. Introduce dolls by name ("This is Sally and this is Jane.")

Show me: Sally hit her.

Show me: Sally hit herself.

Two girl dolls with flexible arms and doll spoon. Show action of feeding with spoon. Introduce dolls as above.

Show me: Jane feeds her.

Show me: Jane feeds herself.

Comparatives

Comparatives are also rather late in appearance in the children's speech we have studied. We can investigate children's comprehension of comparatives in the following way:

A boy and girl doll. Some piles of clay or marbles.

Show me: The boy has more marbles than the girl.

Show me: The boy has less clay than the girl.

Three red sticks of different lengths. Three blue sticks of different lengths. Identifiy red and blue.

Give me: A red stick is shorter than a blue stick.

Give me: A red stick is longer than a blue stick.

Three short sticks of varying thicknesses. Three long sticks of varying thicknesses. Identify short and long sticks.

Give me: A short stick is wider than a long stick.

Give me: A short stick is narrower than a long stick.

Passives

Suppose we are presented with a sentence in which most of the words are familiar: "The boy lop washed zug the girl." We understand most but not all of the sentence. We could pick out "the boy" - "washed" - "the girl." "Lop" and "zug" are not words for us and we do not know how they affect the rest of the sentence. If we were asked to act out this sentence without further information, we might make the best guess available to us, and act out the aspects we understood. In English word order of nounphrase--verb - noun-phrase generally signals subject--verb--object, however we define these terms.

There is a set of sentences, however, which reverses the normal word order; namely, sentences in the passive voice. Thus "The car hits the train" becomes in the passive voice "The train is hit by the car." Notice that the two are equivalent in meaning, although the subject and object order are

reversed. The full passive is another late appearing construction in children's speech. It is often not understood or used until after 4 years of age. If younger children have only partial understanding of these sentences, we would expect something like our processing "The boy lop washed zug the girl." When forced to make an interpretation, the younger children might act out the active form of the sentences, suggesting that they processed them as subject--verb--object like a normal English sentence with some unknown appurtenances added.

A boy and a girl doll on the table and a washcloth. Identify the boy and the girl and the action of <u>washing</u>.

Show me: The boy is washed by the girl.

Show me: The girl is washed by the boy.

A cat and a dog (stuffed toy animals). Identify each and show action of <u>chasing</u>."

Show me: The cat is chased by the dog.

Show me: The dog is chased by the cat.

A boy and a girl doll and a doll fork or spoon. Identify each and show action of "<u>feeding</u>."

Show me: The girl is fed by the boy.

Show me: The boy is fed by the girl.

<u>Self-embedded Sentences</u>

One of the most interesting properties of languages is that sentences can be indefinitely long, therefore, the set of possible sentences of a language is infinite. One way to achieve this length is by opening the sentence and adding constituents or sentences. Suppose the original sentence is "The boy chased the ball." We can insert "The boy lives on the next street" giving us: "The boy who lives on the next street chased the ball."

Further we can insert "The boy lives in the white house at the top of the hill." giving us: "The boy who lives on the next street in the white house at the top of the hill chased the ball," and so on. The sentence could become indefinitely long by this process. We have embedded one sentence inside another.

We may want to know at what stage children learn to understand (or undo) self-embedded sentences. We can ask the child to act out sentences of these types as follows:

A boy and a girl doll in standing positions with flexible arms. Identify boy and girl and demonstrate hitting and falling.

Show me: The boy that the girl hit fell down.

Show me: The girl that the boy hit fell down.

A toy cat and dog. Identify and show chasing and jumping.

Show me: The cat that the dog chased umped.

Show me: The dog that the cat chased jumped.

Relationships within self-embedded sentences are signalled by word order. In the sentences above, interpretation involves recognizing the outer sentence /the boy fell down/ and the inner sentence /the girl hit the boy/. An alternative ordering would change the sense of the inner sentence: /the boy hit the girl/. These are difficult sentences, but we could test them as follows:

As above: A toy cat and dog, chasing and jumping.

Show me: The cat that the dog chased jumped.

Show me: The cat that chased the dog jumped.